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# THE UNITED STATES OF AMERICA

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UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office

July 15, 2003

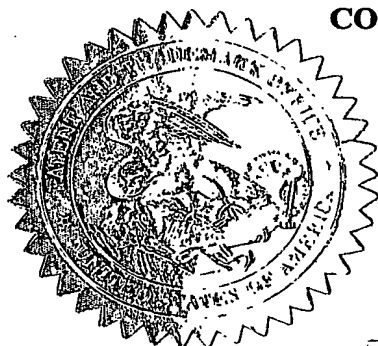
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APPLICATION NUMBER: 60/389,906

FILING DATE: June 18, 2002

RELATED PCT APPLICATION NUMBER: PCT/US03/19101

By Authority of the  
COMMISSIONER OF PATENTS AND TRADEMARKS



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06-18-02

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06/18/02  
JCS12 U.S. PTO

Practitioner's Docket No. 101004.0002PRO

PATENT

J1036 U.S. PTO  
60/389906

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Thompson, George

For: POWER ASSEMBLIES, METHODS AND USES THEREOF

Box Provisional Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

COVER SHEET FOR FILING PROVISIONAL APPLICATION  
(37 C.F.R. § 1.51(c)(1))

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 C.F.R. § 1.51(c)(1)(i). The following comprises the information required by 37 C.F.R. § 1.51(c)(1):

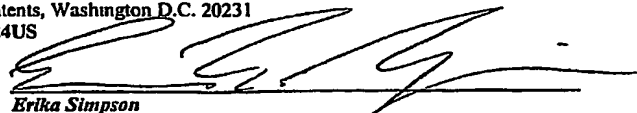
1. The following comprises the information required by 37 C.F.R. § 1.51(c)(1):
2. The name of the inventor is (37 C.F.R. § 1.51(c)(1)(ii)):
  1. George Thompson
3. Residence address of the inventor, as numbered above (37 C.F.R. § 1.51(c)(1)(iii)):
  1. S. 2515 Timberlane Drive  
Veradale, WA 99037

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Date: 6/18/02

  
Erika Simpson

4. The title of the invention is (37 C.F.R. § 1.51(c)(1)(iv)):

POWER ASSEMBLIE, METHODS AND USES THEREOF

5. The name, registration, customer and telephone numbers of the practitioner are (37 C.F.R. § 1.51(c)(1)(v)):

Name of practitioner: Sandra P. Thompson  
Reg. No. 46264  
Tel. 714-641-5100

6. The docket number used to identify this application is (37 C.F.R. § 1.51(c)(1)(vi)):

Docket No. 101004.0002PRO

7. The correspondence address for this application is (37 C.F.R. § 1.51(c)(1)(vii)):

Sandra P. Thompson  
611 Anton Blvd., Suite 1400  
Costa Mesa, CA 92626

8. Statement as to whether invention was made by an agency of the U.S. Government or under contract with an agency of the U.S. Government. (37 C.F.R. § 1.51(c)(1)(viii)).

This invention was NOT made by an agency of the United States Government, or under contract with an agency of the United States Government.

9. Identification of documents accompanying this cover sheet:

A. Documents required by 37 C.F.R. § 1.51(c)(2)-(3):

Specification:	No. of pages	7
Drawings:	No. of sheets	23

B. Additional documents:

None

10. Fee

The filing fee for this provisional application, as set in 37 C.F.R. § 1.16(k), is \$80.00 for a small entity.

Applicant is a small entity.

11. Small entity assertion

Small entity status is asserted for this application by payment of the small entity filing fee under § 1.16(k). 37 C.F.R. § 1.27(c)(3).

12. Fee payment

Fee payment in the amount of \$80.00 is being made at this time.

13. Method of fee payment

Charge Account No. 502191, in the amount of \$80.00.

Please charge Account No. 502191 for any fee deficiency.

Date:

6/18/2002

*Sandra Thompson*

Sandra P. Thompson  
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611 Anton Blvd., Suite 1400  
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714-641-5100

Inventor: Thompson, George  
Rutan Docket No.: 101004.0002PRO  
Assignee: Purcell Systems, Inc.  
Short Title: Power Assemblies

Patent - Provisional

## POWER ASSEMBLIES, METHODS AND USES THEREOF

Commercial and residential consumers are steadily increasing their purchasing and use  
5 of electronics and broadband communications (including Ethernet) components and products,  
as these electronics and broadband communications components replace traditional, and in  
some cases obsolete, electronics and communications products. This increase has led to a  
demand for smaller, more efficient, easier to install and flexible power assemblies, sources,  
supplies and power shields.

10 Traditional and/or conventional power assemblies, supplies and sources are generally  
installed indoors and require an electrical outlet. However, with emerging broadband services  
models which include fiber-to-the-home, cable and wireless delivery methods, access  
equipment is often deployed outdoors. In those instances an electrician or other licensed  
professional and possibly an electrical permit is required to connect and configure the power  
15 assembly properly. These power supplies and assemblies can be cumbersome and costly to  
install in smaller homes and apartments, can be destructive to property and non-removable in  
leased commercial space, and can be completely unmanageable in an older home that likely  
has significant wiring considerations and/or inadequate/poor wiring for today's electronic and  
communications devices.

20 An example of conventional prior art indoor power supplies and sources is the  
PowerShield™ line of products produced by APC. (see Attachment A) The "installation  
instructions" for this prior art device are shown herein as Attachment B. These instructions  
highlight the inherent disadvantages of these devices, including a) these devices must be  
installed by "qualified service personnel"; b) these devices are not designed to be used outside  
25 or in extreme conditions; and c) these devices are strictly AC powered systems, which  
requires a local electrical permit in most instances if outdoor installation was attempted.  
Another example of a conventional power art power supply system is the AlphaPoint Network

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Interface Unit Power Supply, as shown in Attachment C. This system has similar disadvantages as the PowerShield™.

In order to address many of the disadvantages of previously discussed specialized prior art power supplies and sources, a power assembly and related methods and uses thereof has been developed that takes advantage of existing connection ports, while requiring less specialized installation techniques and personnel. Specifically, a power assembly has been developed that a) can be and is designed to operate outside and in relatively extreme conditions, as compared to prior art devices, such as those mentioned earlier; b) is designed to be installed without a local electrical permit and/or an electrician; c) doesn't require specialized wiring or new wiring to install properly; and d) can be used in the smallest of homes or businesses, as long as the home or business is using "metered electricity". As used herein, the phrase "metered electricity" means that electricity that is being received by a local or relatively proximate utility company or service wherein the use of that electricity is measured by a meter placed at or near the residence or business location. In some cases, the power assembly systems contemplated herein will comprise two or more of the benefits and advantages listed above, but it should be appreciated that power assembly systems contemplated herein may only comprise one of the benefits/advantages shown above, and that in no way limits the inherent usefulness of the power assembly system.

Power assemblies contemplated herein are designed to be coupled between a meter base and a meter (herein collectively referred to as the "meter base assembly"). The meter base assembly measures the amount of electricity consumed by the commercial or residential location. Preferred power assemblies comprise a collar unit coupled to an internal power unit.

A collar unit generally comprises a material that can be ejection molded into a casing or collar unit. The material may comprise a suitable material, including polymers, monomers and other compounds. Suitable materials generally comprise those materials that are a) capable of providing sufficient protection for the internal power unit, b) durable, and c) relatively easy to work with. As used herein, the term "polymer" means those compounds

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that comprise any suitable combination of organic, organometallic or inorganic molecules, any of which may or may not comprise a polymer. Examples of contemplated organic polymers are polyimides, polyethers, polyesters, or polybenzils. Examples of contemplated organometallic polymers are various substituted polysiloxanes. Examples of contemplated  
5 inorganic polymers include silicate or aluminate. Contemplated polymers may also comprise a wide range of functional or structural moieties, including aromatic systems, and halogenated groups. Furthermore, appropriate polymers may have many configurations, including a homopolymer, and a heteropolymer. Moreover, alternative polymers may have various forms, such as linear, branched, super-branched, or three-dimensional. The molecular weight of  
10 contemplated polymers spans a wide range, typically between 400 Dalton and 400000 Dalton or more.

As used herein, the term "monomer" refers to any chemical compound that is capable of forming a covalent bond with itself or a chemically different compound in a repetitive manner. The repetitive bond formation between monomers may lead to a linear, branched,  
15 super-branched, or three-dimensional product. Furthermore, monomers may themselves comprise repetitive building blocks, and when polymerized the polymers formed from such monomers are then termed "blockpolymers". Monomers may belong to various chemical classes of molecules including organic, organometallic or inorganic molecules. Examples of contemplated organic monomers are acrylamide, vinylchloride, fluorene bisphenol or 3,3'-  
20 dihydroxytolane. Examples of contemplated organometallic monomers are octamethylcyclotetrasiloxane, methylphenylcyclotetrasiloxane, hexanethyldisilazane, and triethoxysilane. Examples of contemplated inorganic monomers include tetraethoxysilane or aluminum isopropoxide. The molecular weight of monomers may vary greatly between about 40 Dalton and 20000 Dalton. However, especially when monomers comprise repetitive  
25 building blocks, monomers may have even higher molecular weights. Monomers may also include additional groups, such as groups used for crosslinking.

As used herein, the term "crosslinking" refers to a process in which at least two molecules, or two portions of a long molecule, are joined together by a chemical interaction.

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Such interactions may occur in many different ways including formation of a covalent bond, formation of hydrogen bonds, hydrophobic, hydrophilic, ionic or electrostatic interaction. Furthermore, molecular interaction may also be characterized by an at least temporary physical connection between a molecule with itself or between two or more molecules.

5           The collar unit is designed so that it couples easily to a meter base and a meter. The collar unit also comprises ports and openings, such that the power unit can be coupled to an external component, such as an electronic component, a communications component or some other suitable component and/or combination thereof. (see Figure 1)

10           Contemplated electronic components comprise circuit boards, chip packaging, dielectric components of circuit boards, printed-wiring boards, and other components of circuit boards, such as capacitors, inductors, and resistors.

15           As used herein, the term "electronic component" also means any device or part that can be used in a circuit to obtain some desired electrical action. Electronic components contemplated herein may be classified in many different ways, including classification into active components and passive components. Active components are electronic components capable of some dynamic function, such as amplification, oscillation, or signal control, which usually requires a power source for its operation. Examples are bipolar transistors, field-effect transistors, and integrated circuits. Passive components are electronic components that are static in operation, i.e., are ordinarily incapable of amplification or oscillation, and usually  
20           require no power for their characteristic operation. Examples are conventional resistors, capacitors, inductors, diodes, rectifiers and fuses.

25           Electronic components contemplated herein may also be classified as conductors, semiconductors, or insulators. Here, conductors are components that allow charge carriers (such as electrons) to move with ease among atoms as in an electric current. Examples of conductor components are circuit traces and vias comprising metals. Insulators are components where the function is substantially related to the ability of a material to be extremely resistant to conduction of current, such as a material employed to electrically



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separate other components, while semiconductors are components having a function that is substantially related to the ability of a material to conduct current with a natural resistivity between conductors and insulators. Examples of semiconductor components are transistors, diodes, some lasers, rectifiers, thyristors and photosensors.

5           Electronic components contemplated herein may also be classified as power sources or power consumers. Power source components are typically used to power other components, and include batteries, capacitors, coils, and fuel cells. Power consuming components include resistors, transistors, ICs, sensors, and the like.

10           Still further, electronic components contemplated herein may also be classified as discreet or integrated. Discreet components are devices that offer one particular electrical property concentrated at one place in a circuit. Examples are resistors, capacitors, diodes, and transistors. Integrated components are combinations of components that that can provide multiple electrical properties at one place in a circuit. Examples are ICs, i.e., integrated circuits in which multiple components and connecting traces are combined to perform  
 15           multiple or complex functions such as logic.

Telecommunications or communications components include fiber optic cable and other optical materials, such as waveguides, data transmission wires and lines, copper wire, coax cable, keyboards and monitors and the like.

20           The wires, conductive devices, communications components or electronic components can be made from metals or another appropriate conductive material. As used herein, the term "metal" means those elements that are in the d-block and f-block of the Periodic Chart of the Elements, along with those elements that have metal-like properties, such as silicon and germanium. As used herein, the phrase "d-block" means those elements that have electrons filling the 3d, 4d, 5d, and 6d orbitals surrounding the nucleus of the element. As used herein,  
 25           the phrase "f-block" means those elements that have electrons filling the 4f and 5f orbitals

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surrounding the nucleus of the element, including the lanthanides and the actinides. Preferred metals include titanium, silicon, cobalt, copper, nickel, zinc, vanadium, aluminum, chromium, platinum, gold, silver, tungsten, molybdenum, cerium, promethium, and thorium. More preferred metals include titanium, silicon, copper, nickel, platinum, gold, silver and tungsten.  
5 Most preferred metals include titanium, silicon, copper and nickel. The term "metal" also includes alloys, metal/metal composites, metal ceramic composites, metal polymer composites, as well as other metal composites.

The internal power unit may comprise any suitable power converter and/or power source. Power units of the type generally contemplated herein are shown in Attachments D-  
10 G. Attachment D describes a PC60 unit that provides reliable DC power for medium duty fiber optic connected Ethernet subscriber lines. The PC60 is also an AC to DC converter. Attachment E describes a PCD25 unit that provides reliable DC input backup power for medium duty fiber optic connected Ethernet subscriber lines. The PCD25 is a DC version of the PC25 that is designed to work in tandem with the PC60. Attachments F and G show the  
15 product specifications for the PC25 and the PC-130 units. The PC25 and PC-130 are suitable for outdoor use and can be installed anywhere in the world that uses power between 85-240 Volts AC with either 50 or 60 Hz. It should be considered that these power units are examples of the many different types of power units that are available and that can be coupled with the collar units. These units can provide a DC connection for supply/battery  
20 backup/battery chargers and charger boards and can also have additional DC connections (such as a 12 V) for other devices, electronic components and/or communications components and/or devices.

Thus, specific embodiments and applications of compositions and methods to construct, produce and use power assembly systems have been disclosed. It should be  
25 apparent, however, to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the

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terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced.



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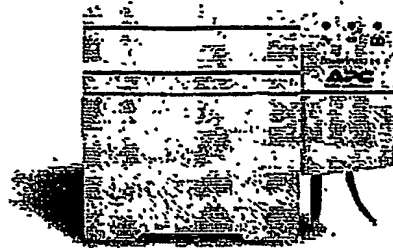
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HOME PRODUCTS SUPPORT SERVICES SELECTORS

Products >> Broadband Power Systems >> PowerShield

#### Product Information

- Model Information
- Features & Benefits
- Product Literature



## PowerShield™

Local powering solution for cable telephony, wireless local loop, fiber to the home, VoIP and VoDSL.

The APC PowerShield solution offers cable telephony, wireless local loop (WLL), and fiber to the home (FTTH) services a simple, cost effective local power supply unit for the customer premise equipment (CPE). In the cable industry's Hybrid Fiber Coax (HFC) networks, for instance, PowerShield offers the Multiple Service Operator (MSO) a local powering solution that has lower installation costs, lower operational costs, and lower service costs than competing powering technologies. For VoDSL applications, the PowerShield provides local power to the Integrated Access Device (IAD), which is designed specifically for small and medium-sized businesses, as well as the small office/home office (SOHO). The IAD enables delivery of up to 8 telephone lines and continuous high-speed Internet or remote LAN access over a single SDSL or T1 interface.

#### Model Information

##### Product Distribution Selector

List products available in



Refresh List

NOTE: Only countries with available distribution for this family are listed.

#### 115/220V 1 phase ( Nominal input voltage )

##### Technical Specifications

POWERSHIELD, UNIV IN, 12VDC, 24W, NAM, APC

##### Part Number Product Distribution

CP24U12D [Product Distribution](#)

#### 125/250 V ( Nominal input voltage )

##### Technical Specifications

POWERSHIELD UNIV IN 24W/12VDC OUT EURO 4 SIGNAL OUTPUT

##### Part Number Product Distribution

CP24U12S [Product Distribution](#)

#### 115/220V 1 phase ( Nominal input voltage )

##### Technical Specifications

POWERSHIELD, UNIV IN, 48VDC, 15W, NAM, APC

POWERSHIELD 50W 48VDC NA3

POWERSHIELD 50W 48VDC SC3

##### Part Number Product Distribution

CP15U48D [Product Distribution](#)

CP50B48NA3 [Product Distribution](#)

CP50B48SC3 [Product Distribution](#)


 **POWERSHIELD 50W-48VDC UK3**

**CP50B48UK3** Product Distribution 

**125/250 V ( Nominal input voltage )**

**Technical Specifications**

**Part Number** **Product Distribution**  
\*

 **POWERSHIELD, UNIV IN, 48VDC, 15W, EURO, APC**

**CP15U48S** Product Distribution 

\* Denotes regional product availability by voltage requirement.

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PowerShield CP14U48, PowerShield CP36U52

# POWERSHIELD INSTALLATION INSTRUCTIONS

## Introduction

This UPS is designed primarily as a wall mount unit, but may sit on a desktop or floor. Qualified service personnel should install the UPS.



**The UPS is shipped with the battery disconnected. You must connect the battery before operating the UPS.**

## Mount the UPS

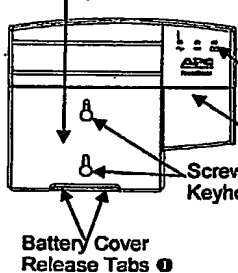


Install the UPS in a protected area that is free of excessive dust and has adequate airflow.

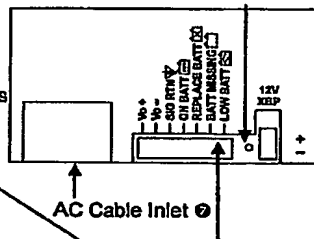
Do not operate the UPS where the temperature and humidity are outside the specified limits. Refer to Specifications below.

1. Use screws that are appropriate for the weight of this unit. (Refer to Specifications below.)
2. Remove the battery cover (lower front panel) by depressing the battery cover release tabs ①.
3. Remove the battery.
4. Place the UPS against the wall in the desired location.
5. Using the keyholes ② as a template, drill holes for two pan head screws (see figure below).
6. Insert a screw into each hole. Leave approximately 5mm of the screw protruding from the wall.
7. Align the keyholes on the UPS with the screws and slide the unit into place. Tighten the screws.
8. Connect the battery.
  - a. *Units 40W or less:* Note the color coded polarity. Connect the red wire to the positive terminal and the black wire to the negative terminal.
  - b. *Units 50W or more:* Connect the battery plug to the UPS connector.
9. Insert the battery into the UPS. Do not pinch the wires. *Units 40W or less:* Battery terminals must be on the right side of the battery, as illustrated on the molded graphic in the battery compartment ③.
10. Replace the battery cover.

**Battery Compartment ③**  
(Battery Cover Removed)



**Cold Start ⑤**



## Status Indicators ④



**On-Line**

The UPS is powered by an AC line. Green indicates normal running conditions. Yellow (if available) indicates on battery running conditions.



**Output OK**

DC output power is provided by utility power or the battery.



**Replace Battery**

Replace the battery. See *Battery Replacement*.

## Cold Start

Cold Start is not a normal condition. When the UPS is off and there is no AC power, use the cold start feature to apply power to the UPS and the connected equipment. To utilize the cold start feature, use a small pointed object to press the recessed cold start button ⑤.

## Connect Equipment and Power to the UPS

1. Connect equipment to the UPS, as appropriate.
2. Plug the UPS power cord into the AC power inlet ⑥ and into the AC power outlet.



The UPS charges its battery when it is connected to AC power. The battery charges fully during the first eight hours of normal operation. **Do not** expect full battery run capability during this initial charge period.

## Order Replacement Battery

Order a replacement battery from APC. See the APC web site at [www.apc.com/support](http://www.apc.com/support) for replacement part numbers and customer service.

## Battery Replacement

1. Remove the battery cover (lower front panel), from the UPS.
2. Lift the battery from the UPS and disconnect the battery.
3. Connect the new battery and place it in the UPS. See *Mount the UPS* sections 8a and 8b.
4. Replace the battery cover.
5. Pack the spent battery in the replacement battery packaging. If this packaging is not available, refer to the APC web site for instructions, [www.apc.com/support](http://www.apc.com/support).



**Batteries must be recycled.** Deliver the battery to an appropriate recycling facility or ship it to the supplier in the new battery packing material.

See the new battery instructions for more information.



**Always DISCONNECT THE BATTERY before shipping in compliance with the United States Department of Transportation (DOT) regulations. The battery may remain in the UPS; it does not have to be removed.**

## Communication Signals ⑦

The PowerShield communication signals are isolated from its internal circuitry via open collector opto-coupled transistors. The connection labeled "Signal Return" is a common return point for all communication signals. In the typical application, the attached equipments digital ground connects to Signal Return, and pull-up resistors turn the open collector signals into logic levels.

On Batt	Low when operating from AC line. Open when operating from battery.
Replace Batt	Low when battery is good. Open when battery fails self test.
Batt Missing	Low when battery is present. Open when battery is missing.
Low Batt	Low when battery is mostly charged. Open when operating from battery and less than 20% capacity remains.

Attachment B  
Prior Art Instructions- page 1

## Service and Technical Support

For service and technical product support, contact APC at [www.apc.com/support](http://www.apc.com/support).

## Limited Warranty

American Power Conversion (APC) warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

EXCEPT AS PROVIDED HEREIN, AMERICAN POWER CONVERSION MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL APC BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.



## Specifications

Input / Output/ Load Listed on rear of unit	CP15U48 100-240V~50-60Hz, 1.0A 48V=15W CP24U12 100-240V~50-60Hz, 1.0A 12V=24W CP38U52 100-240V~50-60Hz, 1.5A 48V=36W TL36U52 100-240V~50-60Hz, 1.5A 48V=36W CP40U48 100-240V~50-60Hz, 1.5A 48V=40W CP50B48 100-240V~50-60Hz, 2.0A 48V=50W
Max Signal Voltage	30V
Max Signal Current	5mA
Battery Type	Spill-Proof, Maintenance-Free, Sealed, Lead Acid
Operating Environment	-20° - 45°C, 0 - 95% Relative Humidity, Non-condensing
Storage Temperature	-20° - 45°C
Max Operating Elevation	3,000 m or 10,000 ft.
Max Storage Elevation	15,000 m or 50,000 ft.
Size (H x W x D)	
15W, 24W, 36W, 40W units	19.1 x 24.1 x 7.9 cm or 9.5 x 5x3.1 in.
50W units	28.27 x 28.27 x 9.53 cm or 11.13 x 11.13 x 3.75 in
Weight	
15W, 24W, 36W, 40W units	3.2 kg or 7 lbs
50W units	8.2 kg or 18 lbs.
EMC	FCC Part 15, EN55022 Class B IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, EN 55024
Safety Approvals	UL 1950, ULC 1950, IEC 60950, EN 60950

CE

2001

## EC Declaration of Conformity

We, the undersigned, declare under our sole responsibility that the equipment specified below conforms to the following standards and directives:

Standards to Which Conformity Declared:

EN50091-1, EN60950, EN50091-1-1, IEC60950  
EN55022, EN50091-2, EN61000-3-2, EN61000-3-3  
73/23/EEC, 93/68/EEC

Application of Council Directives:

Type of Equipment:

Uninterruptible Power Supply

Model Numbers:

CP15U48, CP24U12, TL36U52, AN15U48,

Manufacturer's Name and Address:

CP36U52, CP40U48, CP50B48

American Power Conversion

132 Fairgrounds Road

West Kingston, Rhode Island, 02892, USA

-or- American Power Conversion (A P C) b v

Ballyhnt Business Park

Galway, Ireland

-or- American Power Conversion

Main Avenue, Peza

Rosario, Cavite, Philippines

-or- American Power Conversion

2nd Street, Peza, Cavite Economic Zone

Rosario, Cavite Philippines

-or- American Power Conversion

Lot 32 Phase 1 Camarley Industrial Park

Onahang, Calamba, Laguna Philippines

-or- APC (Suzhou) UPS Co., Ltd

No. 189 Suhong Road, China-Singapore

Suzhou Industrial Park

Suzhou 215021, Jiangsu, P.R.C

American Power Conversion (A P C) b v

Ballyhnt Business Park

Importer's Name and Address:

Place: N Billema, MAUS

Place: Galway, Ireland

5 Jan 01

Richard J. Everett, Sr Regulatory Compliance Engineer

5 Jan 01

Ray S. Ballard, Managing Director, Europe

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Attachment B  
Prior AT Instructions - page 2

## AlphaPoint Network Interface Unit Power Supply



- Provides up to 14 hours of extended battery backup power during utility service interruption
- Built-in Surge protection
- Customer replaceable Battery
- Critical load maintained during battery replacement
- Wall-mounting keyhole for quick, easy wall mounting

Alpha introduces a network interface unit power solution — AlphaPoint. This unique solution provides cable telephony, wireless local loop (WLL) and fiber to the home (FTTH) services a simple, cost effective local power supply for the Customer Premise Equipment (CPE). AlphaPoint products provide continuous -48VDC to locally power CPE equipment such as network interface unit (NIU), cable telephony modems, wireless base stations or FTTH interface modules. Extended runtime capabilities keep network communications, including telephone, up and running during power disturbances and outages.

Attachment C - page 1



## Nominal Specifications

<b>Input</b>	
Voltage Range	85 - 264 VAC
Frequency	50 or 60 Hz
<b>Output</b>	
Voltage	48 VDC
Output Power Nominal	15 W
Output Power Maximum	25 W
Transfer Characteristics	Uninterrupted Output
<b>Battery</b>	
Capacity	7 AH
Type	Sealed lead acid, maintenance free
Battery	Temperature compensated
Backup Time (4 watt average)	14 hours
Recharge Time	18 hours

**LED Indicators**

- OUTPUT okay (green)
- STANDBY operation (green blinking)
- LOW / MISSING BATTERY (red blinking)
- REPLACE BATTERY (red)

**Alarm Indicators**

- AC FAIL
- No Battery
- Replace Battery
- Low Battery

**Mechanical**

Dimensions (in/mm) 9"H x 7"W x 3"D  
(432mm x 305mm x 132mm)

Weight (lbs/kg) 11/5

**Environment**

Operating Temperature 0° to 45°C

Storage Temperature -15° to +45°C

Humidity 0 to 95% relative

**Mounting Configuration**

Wall mount

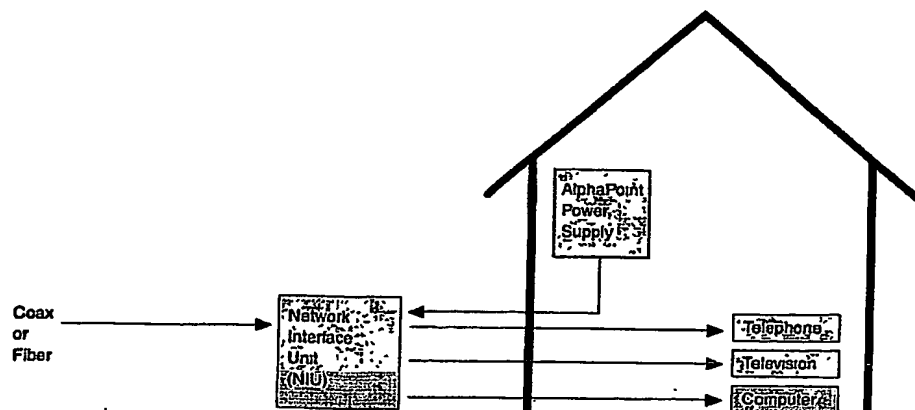
**Certifications**

FCC part 15 Class B

UL 1788 CSA 22 2 No 107 1-M95

## Standard Features

- No Audible Noise
- Cabling cannot be unplugged accidentally
- 2nd External Battery Connection
- User Replaceable Battery
- Reverse Battery Polarity Protection



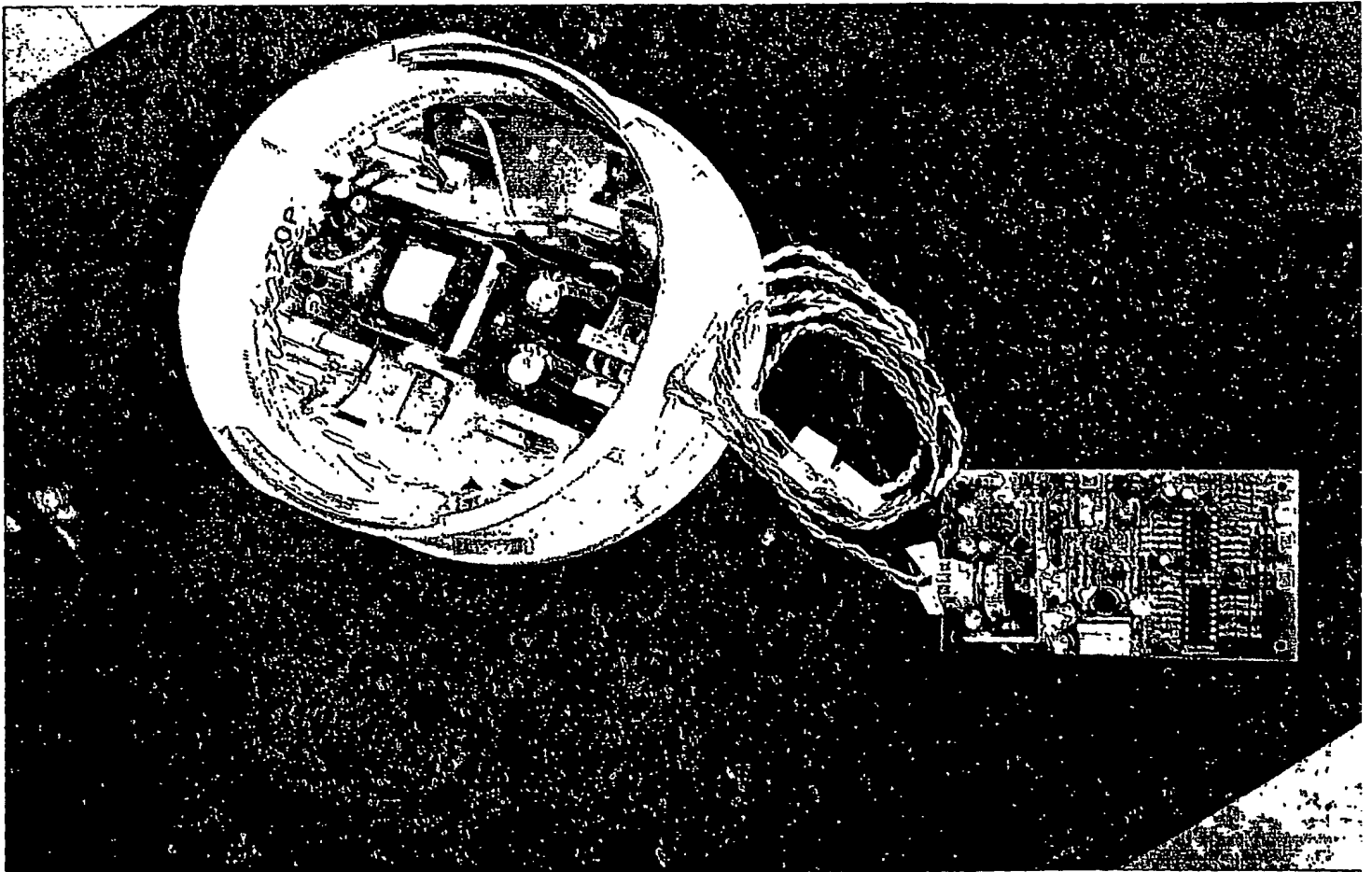
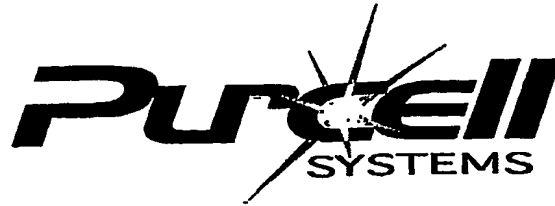


Figure 1



# PC60 Specification

Rev B.

Apr. 4, 2002

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## 1. Description

The PC60 is a compact unit designed to provide a reliable DC power source for (medium duty fiber optic connected Ethernet Subscriber devices). The switch mode supply and DC outputs protect against transient peaks from small generators and local utility power and provide a low noise, low voltage power source.

## 2. Electrical Requirement

### 2.1. AC/DC Power Supply

The power supply should be a switching type and shall meet the following specification:

#### 2.1.1. Input Voltage

Model I – 110VAC $\pm$ 10%, transient condition  $\pm$ 20%.

Model II – 220VAC $\pm$ 10%, transient condition  $\pm$ 20%.

#### 2.1.2. Input Frequency

The input voltage shall be sinusoidal and operate at 47 to 70 Hz.

#### 2.1.3. Output Voltage

Measured at nominal input 110/220VAC

Output	Voltage (VDC)	Current (ADC)
V1	12.0	2.0
V2	18.0	2.0

The ripple shall be less than 5% of each outputs nominal voltage rating.

#### 2.1.4. Output Current

Each output of the power supply shall be capable of delivering 2.0A under continuous operation.

#### 2.1.5. Ripple & Noise

The ripple and noise shall be less than 5% of the nominal rated output voltage.

#### 2.1.6. Output Ground

The output return shall be bypassed through a 0.01uF, 1KV capacitor to the chassis.

#### 2.1.7. Current Limit

The power supply shall limit the maximum power used to 100 watts maximum.

#### 2.1.8. Short Circuit Protection

The power supply shall incorporate a field replaceable fuse to protect against a short circuit placed directly across either output. The fuse rating shall be 2A for Model I and 1A for Model II.

### 3. Environmental

#### 3.1 Operating temperature

The power supply shall operate continuously between -20°C to +60°C.

#### 3.2 Storage Temperature

-35°C to +75°C.

#### 3.3 Humidity

The power supply shall operate continuously in an environment for which the humidity is 0 to 95% non-condensing.

#### 3.4 Altitude Variation

The power supply shall operate between - 500 to 6,000 feet. However, the unit, operating at maximum temperature, may de-rate at a factor of 1°C per 1000 feet. It shall continue to operate after being transported in the air cargo, which is pressurized to 10,000 feet.

#### 3.5. Life Cycle

The power supply shall exhibit an MTBF of no less than 1 million hours.

### 4. Indicator and Status

#### 4.1. LED Status

The power supply shall be equipped with a green Status LED. The LED shall light when the power supply is energized.

### 5. Compliance

#### 5.1 Radio Frequency Interference

- FCC part 15 class B for radiated and conducted emissions; 3db margin min.
- CISPR 22 (EN55022, 1992) class B for radiated and conducted emissions
- CFR 47 Part 15
- VCCI (Japan) (TBD)
- AS/NZS 3548 (Australia) (TBD)

#### 5.2 Safety

- UL/CSA UL60950
- UL/TUV or VDE CB Report
- EN 60950 (TUV mark)
- CE Mark

### 6. Mechanical Requirements

#### 6.1 Input Connection

- 6.1.1 The power supply units shall have quick disconnect male terminals for input AC connection.

## 6.2 Output Connection

The power supply unit's output connector shall be TBD.

## 6.3 Size and weight

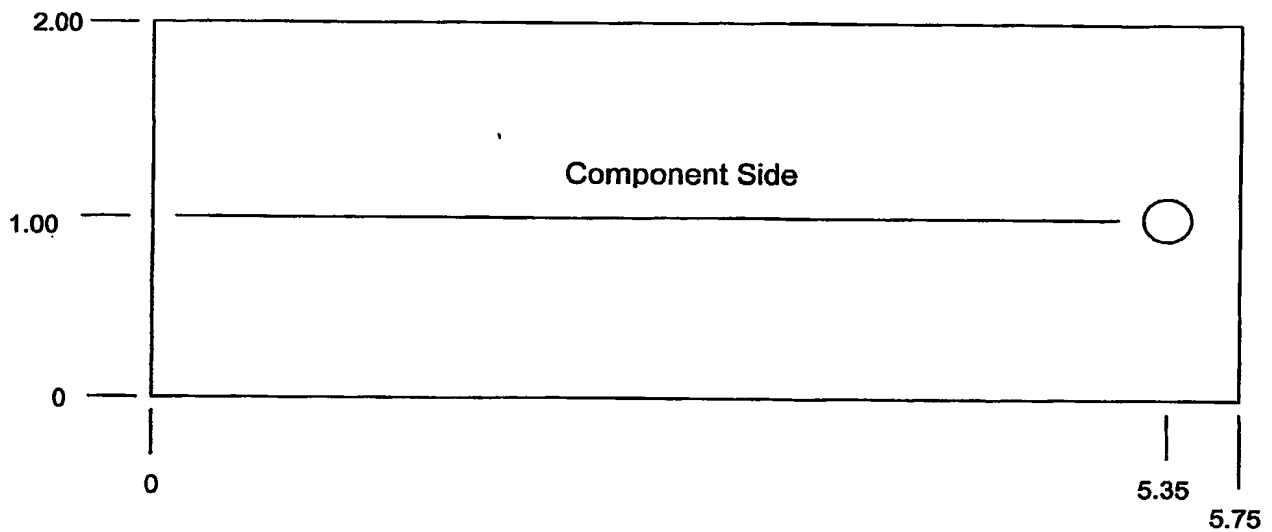
6.3.1 Dimension: 146.05mm x 50.8mm x 50.8mm

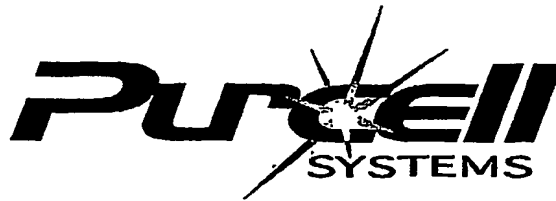
6.3.2 Weight: less than 1 pounds.

### Mechanical

**Table 1- Mechanical Requirements**

PCA dimensions: 5.75"L x 2.0"W x 2.0"H
Mounting Holes: Holes must accommodate size #10 screws. Location of holes must be agreed upon by WWP.
Weight: < 1 lbs





# PCD25 Specification

Rev A.

Apr. 4, 2002

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## 1. Description

The PCD25 is a compact unit designed to provide a reliable DC input backup power for medium duty fiber optic connected Ethernet Subscriber devices. PCD25 provides a switched mode medium duty power output of 12VDC and a battery charger output of 12VDC for large capacity batteries 12 V @ 7 AH allowing full recharge in the minimum possible time. The switch mode supply, DC output and heavy duty batteries protect against transient peaks from small generators and provide a noise free alternate power source.

## 2. Electrical Requirement

### 2.1. DC/DC Power Supply

The power supply should be a switching type and shall meet the following specification:

#### 2.1.1. Input Voltage

The input voltage shall be between 15 to 18 VDC.

#### 2.1.2. Input Frequency

The input voltage shall be direct current DC.

#### 2.1.3. Battery charger voltage setting

The battery charger output voltage shall accommodate a 12VDC nominal battery pack and shall vary according to the charge state of the battery; the charger output can swing from 11 VDC to 13.8 VDC maximum.

#### 2.1.4. Output Voltage

The output voltage shall be at least 11 VDC minimum to 14 VDC maximum at 1.2A load. The ripple shall be less than 0.05Vrms.

#### 2.1.5. Output Current

The power supply shall be capable of delivering 12V @ 1.2A under continuous operation regardless of the battery charger current.

#### 2.1.6. Output Ground

The output return shall be connected through a 0.01uF, 1KV capacitor to the chassis.

### 2.2. Disconnect Switch

NOT APPLICABLE

### 2.3. Battery

#### 2.3.1 Type

The battery shall be sealed, Lead-Acid rechargeable, and maintenance free -- 12V @ 7AH pack.

#### 2.3.2 Voltage

The battery shall provide an output voltage of 11.0 to 13.8 VDC at 1.2A load.

#### 2.3.2 Operation Time

The battery shall have enough power to backup Ethernet device for TBD hours at TBD Load current.

#### 2.3.3 Recharge Time

The battery shall be fully recharged within 8 hours after discharge while supplying 1.2 Amp to the load.

#### 2.3.4 Low Voltage disconnection

The battery shall be disconnected from the load when terminal voltage drops below 10.1Vdc to avoid any damage. It shall remain disconnected until DC power is restored.

#### 2.3.5 Output short circuit protection

The power supply unit shall have short circuit protection against the output load being accidentally shorted, to protect the internal battery and power supply circuitry.

### 3. Environmental

#### 3.1 Operating temperature

The power supply shall operate continuously between -20°C to +60°C.

#### 3.2 Storage Temperature

-35°C to +75°C.

#### 3.3 Humidity

The power supply shall operate continuously in an environment for which the humidity is 0 to 95% non-condensing.

#### 3.4 Altitude Variation

The power supply shall operate between - 500 to 6,000 feet. However, the unit, operating at maximum temperature, may de-rate at a factor of 1°C per 1000 feet. It shall continue to operate after being transported in the air cargo, which is pressurized to 10,000 feet.

#### 3.5. Life Cycle

The battery shall operate continuously for a minimum of 2 years.



**7.3 Battery Accessibility**

The battery shall be easily replaceable and located within the cabinet enclosure less than 2 feet from the charger.

**7.4 Size and weight**

7.4.1 Dimension: 110.7mm x 63.5mm x 38.1mm

7.4.2 Weight: less than 1 pound for 7 AH version,  
less than 1 pound for 4.5 AH version



## Product Specification

Product Name: WWP25W

Product Description: Universal AC Input - 25W, 12VDC @ 1.2A Output

Date: 8/3/2000

Rev: 1

### Input Characteristics

	Min.	Max.	Units
Voltage	85	265	Vrms
Current	-	0.5	Amps RMS
Frequency	47	70	Hz

### Output Characteristics

	Min.	Nom.	Max.	Units
Voltage (line)	11	12	14	Volts DC
Voltage (battery)	11	12	13.8	Volts DC
Current	-	-	1.2	Amps
Current Limit	N/A	N/A	N/A	Amps @ 12 Volts
Ripple Voltage	-	-	0.1	Vrms

### Battery Characteristics

	Min.	Typ.	Max.	Units
Capacity	-	7.2	-	Amp-Hour
Low Volt Disconnect	10.1	10.2	10.3	Volts DC
Low Battery Warning	10.8	11.2	11.5	VDC
Run Time	TBD	-	-	Hours
Recharge Time	-	-	TBD	Hours to 90% capacity

### Status Signals on Interface Cable

Signal	Description	Conn./pin #
On Battery	Active low when operating from battery – isolated	CN3
Battery Present	Active low when battery is installed – isolated	CN4
Low Battery	Active low when battery voltage is below 11.0 Volts, or when no battery installed, Battery Present = high – isolated	CN5

Purcell Systems

(509) 755-0341

**Visual Status Signals**

Output Present Green LED lit when 48 Volt output is present.

On Line Green LED lit when BBU operating on AC power (OPTION ONLY).

Battery Missing Red LED lit when battery is not installed (OPTION ONLY).

**Environmental**

	Min.	Max.	Units
Operating Temperature	-20	+60	°C
Storage Temperature	-33	+75	°C
Humidity	-	95	% non-condensing

**Mechanical**

PCB Dimensions: 6.92"Lx 2.5"Wx 2.0"H

Weight: &lt; 4 lbs.

Mounting holes provided for panel mounting

AC Input connector: Molex 26-60-4050 or equivalent

Output connector: Molex 26-60-4040 or equivalent

**Agency Approvals**

EMC:	TBD
ESD:	TBD
EMI Immunity	TBD
EFT:	TBD
Surge Immunity:	TBD
Continuous Conducted Signal Immunity:	TBD
Safety:	EN 60950/IEC 950/UL1950

Units will be marked with CE for Europe, UL for USA, and ULc for Canada.

Table 1

Load (Watts)	Battery Run time (hours @ 23°C typ)
5	TBD
15	TBD
25	TBD

**Supply/Charger Spec Requirement Sheet****Product Specification**

Product Name PC-130

Product Description: Universal AC Input - 130W (230WPK), 48VDC @ 2.7A Output

Date: 10/25/2001

Rev: B

**Input Characteristics**

	Min.	Max.	Units
Voltage	85	264	Vrms
Current	-	3	Amps RMS
Frequency	47	63	Hz
Inrush Current		30 (60)	Amps @ 115V (@ 230V)
<b>Harmonics:</b> per EN61000-3-2, Class A and EN61000-3-3			

**Output Characteristics**

	Min.	Nom.	Max.	Units
Voltage (line)	44	48	56	Volts DC
Current	-	2.7+1.7'	-	Amps O/P + Charger
Current Limit	N/A	N/A	5.5	Amps @ 48 Volts
Ripple Voltage	-	-	2.0	Vrms (20MHz Bandwidth)

**Battery Characteristics**

	Min.	Typ.	Max.	Units
Capacity	-	17	-	Amp-Hour
Low Volt Disconnect	34	36	38	Volts DC
Low Battery Warning	42	-	45	VDC
Run Time	-	5 (-02)	-	Hours
Recharge Time	-	-	12	Hours to full capacity

**UPS Alarm Logic Table**

		AC Normal	Charger Fail	On Battery	Low Battery	Replace Battery	Battery Not Connected
Signal 1	On Battery	L	L	H	H	L	L
Signal 2	Replace Battery	L	x	L	H	H	X
Signal 3	Battery Exists	L	x	L	L	L	H
Signal 4	Charger Good	L	H	X	X	L	L

(Opto-Coupler open collector output &gt; 1 milliamp 30V)



**Visual Status Signals - Optional**

Output Good: Green LED lit when 12 Volt output is present.

On AC: Green LED lit when supply is operating on AC power.

Battery Missing: Green LED lit when battery is not installed.

**Environmental**

	Min.	Max.	Units
Operating Temperature	-33	+55	°C
Storage Temperature	-40	+70	°C
Humidity	-	100	% non-condensing

**Mechanical**

Dimensions: 7.0"Lx 4.0"Wx 2.0"H (Power Supply/Charger)

Weight: < 5 lbs.

Mounting holes provided for panel mounting

AC Input connector: Molex equivalent (3941 5 pin, 0.154 spacing)

Output connector: Molex TBD equivalent (3941 8 pin, 0.154 spacing) External to the UPS, there is a single output (including logic) connector.

Logic connector: JST or Molex equivalent (2011 4 or 5 pin, 2mm spacing)

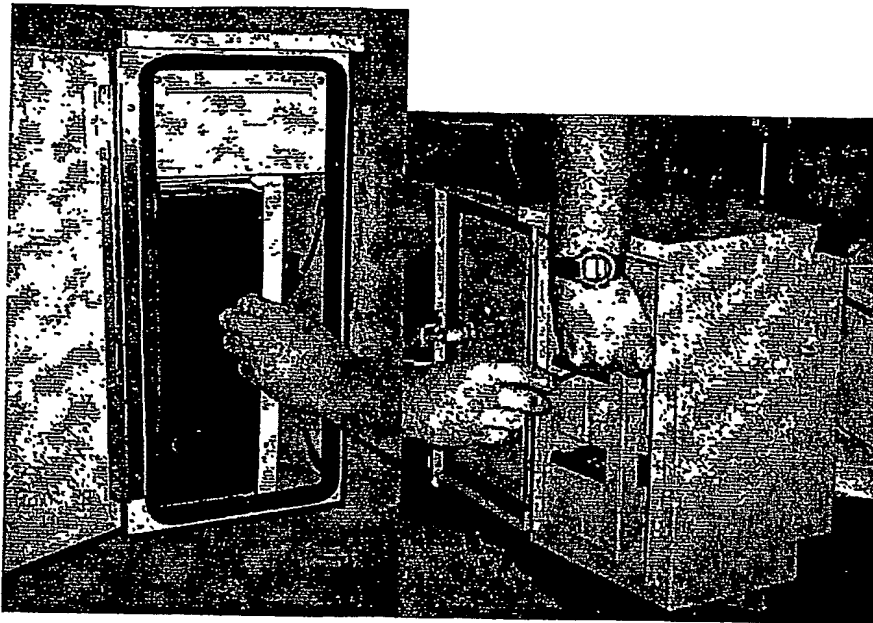
**Agency Approvals**

EMC:	EN50091-2: 1995, FCC 47 CFR Part 15 (15.107e, 15.109g as a minimum)
ESD:	EN61000-4-2, Level 3/Class 3
EMI Immunity	EN61000-4-3, Level 3
EFT:	EN61000-4-4, Level 3
Surge Immunity:	EN61000-4-5, Level 3/Class 3
Safety:	EN50091-1:1993, EN50091-1-1:1996, UL1778, CSA 22.2 No. 107.1-9.5

Units will be marked with CE for Europe, UL for USA, and CSA for Canada.

17 AH Battery System

7.2 AH Battery System



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